CREATIVITY IN EARLY CHILDHOOD: VALIDATION OF THE STARKWEATHER ORIGINALITY TEST

By

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CREATIVITY IN EARLY CHILDHOOD: VALIDATION

OF THE STARKWEATHER ORIGINALITY TEST

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To my husband, Max, I owe the debt of understanding and patience in both my program of study and myself.

To

My Son

Cody

With hope that he will be one of the many children who become happier, more creative and productive adults.

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CHAPTER I

INTRODUCTION

Purpose

The purpose of this study was to validate the Starkweather Originality Test, a test designed to measure the creative potential of preschool children. Validation was achieved by comparing children's scores on the originality test with scores indicating the freedom with which they express themselves in exploring and manipulating objects in their environment. Both originality and freedom of expression are considered essential qualities of the creative person.

Problem

Creativity Defined

Research into the nature of creativity has enhanced the meaning of creativity, but still leaves it difficult to define. Bachrach (1972), in discussing the problems encountered in defining research variables, described three levels of definition--daily, poetic, and scientific. Only one of these three should be used in research--the scientific definition.

The daily definition is one that is universally accepted, one for which there is a general understanding. (Bachrach, 1972). Looking to

the dictionary for a daily definition of creativity, one finds that to create means to originate.

The poetic definition does not need to be universally accepted nor generally understood, but it is treated as belonging within the realm of individual license and creativity. (Bachrach, 1972). In describing a writer's viewpoint on creativity, Elizabeth Yates (1966) spoke of creativity as inherent, and referred to our responsibility as that of nurturing, fostering, and encouraging creativity.

> Let me name five things which, to my thinking, are involved in creativity. The ground from which these rise is a religious attitude to life. This has nothing to do with creed; it has a great deal to do with reverence for our world, respect for our consciences, and an awareness of a Being beyond our own. My five, based on this attitude begins with imagination; free, and yet in time controlled, and always trustworthy. . . . Imagination enables one to approach everyday events as fresh and happy challenges; . . . it enables one to do ordinary things in unordinary ways.
>
> My second is intuition. This involves a readiness, an eagerness to follow the hint that comes inwardly; it requires strength to stand on that inner prompting. This that comes to you to do is, then, something that must be done or you will not be able to go on living with yourself. For it you assume full responsibility. This that comes to you to do must be done, whether it is understood or appreciated, whether it succeeds or not. In time it will succeed and early failures will only appear as necessary first steps. . . .
>
> My third is discipline. With it there is acceptance of the hard work required, acceptance mounting almost to joy. It is this joy that makes you willing to forego sleep, food, friends, fun, anything that might entice, for one definite purpose. When that is seen and gone along with, then there is the deeper realization that only with discipline is full freedom gained. . . .
>
> My fourth is autonomy. By this I mean that you must be able to be your own judge and juror, and that you must act in relation to your own conscience. You do not need the approval of anyone but yourself. If your standards are met, approval will come like the total to a column of figures, it will be inevitable. But, please yourself or you please no one. . . .

> My fifth links with each one of the others. It is openness--to the life around one, to the movement of the spirit. All that has gone on before--imagination, intuition, discipline, autonomy--helps to make this possible. . . . (Yates, 1966, pp. 24-26).

The scientific definition is restricted to a limited group of scientists for whom the definition must have specific meaning. (Bachrach, 1972). For example, at the Institute of Personality Assessment and Research at the University of California, true creativeness has been defined by MacKinnon, director of the Institute, as fulfilling at least three conditions.

> (True creativeness) involves a response that is novel or that is at least statistically infrequent. But novelty or originality of thought and action, while a necessary aspect of creativity, is not sufficient. If a response is to lay claim to being a part of the creative process, it must to some extent be adaptive to, or of, reality. It must serve to solve a problem, fit a solution, or accomplish some recognizable goal. And, thirdly true creativeness involves a sustaining of the original insight, an evaluation and elaboration of it, a developing of it to the full. Creativity from this point of view, is a process extended in time and characterized by originality, adaptiveness, and realization. (MacKinnon, 1965, p. 160).

Creativity Measured

The acceptance of MacKinnon's definition of true creativeness determined the specific course of the research at the Institute of Personality Assessment and Research. No attempt was made to study creativity until it had found expression in clearly identifiable products, such as buildings designed by architects, mathematical proofs developed by mathematicians, and published writings of poets and novelists. Products such as these were accepted as meeting the three criteria of true creativeness. Subsequently, the steps involved in the study of creativity in adults were as follows: (1) Creative adults

were identified by their products--products characterized by originality, adaptiveness, and realization. (2) Each creative adult was studied intensively by a variety of means, including written tests and questionnaires. (3) The characteristics which these creative adults have in common were identified.

In studying creativity in children, it is difficult to identify subjects by their creative products. A child's product or behavior may be original for him; but unless you know the specific child and know what his experiences have been, you have no way of evaluating whether his product is creative or imitative. For example, one little girl chose, as a gift for her teacher, a catfish for the classroom aquarium. The aquarium needed cleaning, and the catfish could do the job. This act was unique for this particular child and could be evaluated as creative. However, in many situations with young children, there is no way of judging whether their behavior is creative or not because the qualities of adaptiveness and realization cannot be evaluated as was possible in the case of this particular child.

> One cannot start with creative production when one is interested in studying creativity in early childhood; instead, the focus of attention must be on creative potential, which has been described by Guilford (1965) as the collection of abilities and other traits that contribute toward creative thinking. (Lane, 1971, p. 14).

A study of the creative potential of young children logically begins with observation of their behavior--observation designed as a search for the characteristics that have been identified as common among creative adults. Here the underlying assumption is that a person who possesses characteristics common to creative adults is potentially creative even though he may not have demonstrated this creativity in a specific product.

Some of these characteristics are ones for which there is behavioral evidence in early childhood. For example, originality, independence, and freedom of expression can be observed in the behavior of a young child. Other characteristics common to creative adults develop with maturity and are not often found in a young person, and still others are less tangible qualities which are difficult to examine objectively. These include openness to experience, strong theoretical and aesthetic interests, and a strong case of destiny--all of which have been described by MacKinnon (1965).

In any study of creativity, whether with adults or with children, the validation of measuring devices is a most important and complex problem. No research instrument is of value unless its validity is satisfactorily demonstrated; and when an instrument is designed to give an objective measurement of characteristics that exist in early childhood, the validation problem can be extremely complex. It is on this problem that the current research was focused.

CHAPTER II

REVIEW OF LITERATURE

The purpose of the present research was to validate the Starkweather Originality Test, a test designed to measure the creative potential of young children. In this chapter, as a background for the research, the development of the originality test is discussed, the research technique for studying children's freedom of expression is described, various methods of validating research instruments are discussed, and implications for the present research are presented.

Development of the Originality Test

Originality has frequently been referred to as a valid indicator of creative ability. However, where adults are concerned, originality is not indicative of true creativeness unless it is accompanied by adaptiveness and realization. (MacKinnon, 1965). To be accepted as creative, it must to some extent be adaptive to reality; for example, it may serve to solve a problem, or to accomplish some recognizable goal. Also, if behavior is to be accepted as creative, it must be characterized by realization, that is, it must be carried through to completion so that there is an end product.

In the study of creativity in early childhood, the adaptiveness and realization factors are not used as the criteria of creativeness because of their elusive quality; and therefore, the focus is on

originality per se. But even where this one factor of originality is concerned, the research procedure with adults and children differs. In research with adults, it has been possible to discriminate several closely related factors--originality, elaboration, fluency, and flexibility. In research with young children, this type of discrimination has no real meaning. It is doubtful that these four factors are differentiated in early childhood; and if children's responses were to be scored in terms of these four factors, adult value judgments would be introduced and this alone could destroy the significance of the research. The elimination of adult value judgments from research with young children has been a major goal in the creativity research program at Oklahoma State University.

> In the development of each instrument, . . . the goal was always the development of a game which the child would want to play--a game in which his behavior provided an answer to the researcher's question. . . . Adult judgments of the children's responses were avoided, and scoring problems were minimized by designing instruments which permitted simple behavioral responses that could be scored objectively. (Starkweather, 1971, p. 3).

In the Starkweather Originality Test, there is no attempt made to discriminate among the four factors of creative ability mentioned above. It is possible that each one of the factors contributes to the child's score on the originality test. The factor of <u>originality</u> is evident in the uniqueness of a response, in that a child received credit for every response that is different from all other responses that he makes. <u>Elaboration</u> is evident when a child describes an object in detail so that you know it is different from any similar object he mentioned earlier in the test. He may describe a bridge as one over a brook or one that a train runs on. <u>Fluency</u> is exemplified when a child

gives responses which are similar in category, as when responding with letters or numbers; and yet items in any one category are rarely given consecutively. Flexibility is evident when a child changes from one category of response to another. However, inasmuch as similar responses are usually not given consecutively, a change from one category to another can rarely be observed.

The development of the Starkweather Originality Test began in 1962 with exploratory use of materials designed for older subjects. In this initial research, problem areas were identified and clues were provided for the way in which an appropriate instrument might be developed. The major problems were encountered in scoring the children's responses and in the selection of the appropriate stimulus materials.

> Statistical infrequency, as usually applied to the scoring of originality tasks, compares one child's responses to those of other children. By this method, the child who has a pet name for an object will profit inasmuch as his responses will not be duplicated by another child, and yet his ideas may not be more original than those of other children. This scoring problem was solved by comparing each child with himself rather than with other children. In other words, each response of a given child was compared to all other responses made by that child; and then the child who gave the greatest variety of responses was judged to be the most original.
>
> Line drawings, frequently used in the study of originality, were impractical because young children want to handle the materials about which they are talking. Simple three-dimensional objects were needed; and styrofoam, which can be cut into various shapes, served this purpose. (Starkweather, 1966, p. 7).

The Starkweather Originality Test, as currently used, consists of a pre-test or a warm-up session and the test proper. During the pre-test the experimenter encourages the child to think of a variety of responses, but during the test proper the child's responses are accepted without question even though he may repeat the same idea several

times. The test materials consist of three-dimensional abstract forms made of plastic foam. The children respond to the forms, one at a time, telling what each might be. The scoring is a simple count of the number of different responses, and the high scores indicate the more original children. A complete description of the Starkweather Originality Test, its administration and scoring, is presented in Appendix B. The administration of the test is illustrated in Figures 1 and 2.

Freedom of Expression

One of the first exploratory studies in the creativity research at Oklahoma State University, was a study of the freedom with which young children express themselves in exploring and manipulating objects in their environment. This freedom was accepted as a pervasive characteristic of creative ability and was assumed to be independent of intellectual ability. Research was designed which identified highly creative children by their freedom of expression, and which demonstrated that this freedom is independent of intellectual ability. (Starkweather and Azbill, 1965).

The experimental situation designed to measure freedom of expression was one in which each child played by himself with a series of simple toys. The toys were ones which could be put to a number of uses, and many of them were toys with which the children had had little or no previous experience--for example, wax discs and a pan of water. Each child's freedom of expression was measured in terms of the variety of ways in which he played with the toys. His play behavior was scored in terms of the sensory experiences he used in exploring and

Figure 1. Administration of the Pretest for the Starkweather Originality Test

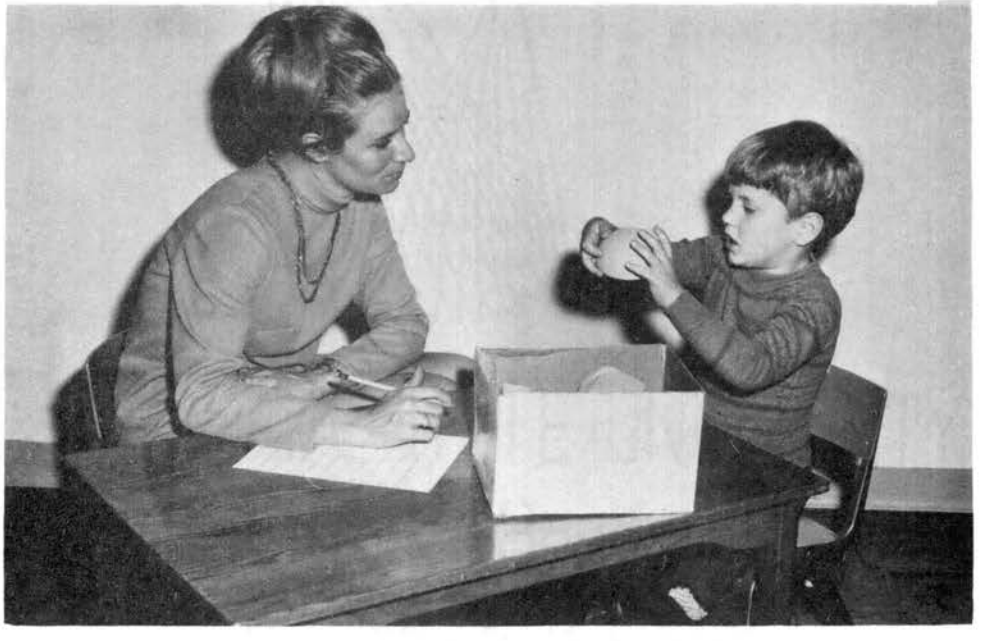


Figure 2. Administration of the Starkweather Originality Test

manipulating the toys, the games he invented, the constructions he made, and the freedom with which he combined the toys in play.

> A significant negative correlation was found between freedom of expression and intelligence test scores, supporting the assumption that freedom of expression, like creative ability, is a nonintellectual variable. This negative relationship must not be interpreted as meaning that highly intelligent children lack freedom to express themselves, but it does indicate the advisability of research into the causes of the relationship which appeared in the study. A hazarded guess is that the demands made on children for conformity and achievement may in some way inhibit their freedom of expression. A study in which the variable of intellectual ability is controlled could provide information about possible factors which influence the development of freedom of expression and, in turn, the development of creative ability. (Starkweather, 1965), p. 179).

The play behavior of the children who participated in this study resulted in a wide range of scores, indicating that some children were extremely inhibited and others were extremely free when playing by themselves. The fact that these children were of preschool age indicates that the encouragement and the stifling of freedom of expression occurs during the preschool years; and by implication, this means that the encouragement and stifling of creativity occurs during early childhood.

A reprint of the Starkweather and Azbill research report (1965) is presented in Appendix C. This reprint is included in order that the reader have access to the details of the original research which was adapted for the present study.

Validation of Research Instruments

The validity of a research instrument has been defined as follows:

> . . . the extent to which differences in scores on it reflect true differences among individuals, groups, or situations, in the characteristic which it seeks to measure, or true

> differences in the same individual, group, or situation from one occasion to another, rather than constant or random errors. (Selltiz et al., 1969, p. 155).

Within this definition, there are several different ways of looking at validity, each depending on the questions one is asking.

There are three general approaches to validation which are frequently used in the development and testing of research instruments. These are content validity, criterion-related validity, and construct validity. (Treffinger and Poggio, 1972).

To have content validity, an instrument must cover a representative sample of the behavior that it is designed to measure. For example, in a test designed to measure reading-readiness, it is important that all of the skills which a child will use in reading and which must be mature if he is going to read well, should be tapped. Examining a reading-readiness test to make sure that it does sample all of these abilities would be a way of providing content validity.

To have criterion-related validity, an instrument must distinguish individuals in terms of some criterion. Both concurrent and predictive validity are of this type. An instrument is said to have concurrent validity if it distinguishes individuals who differ in their present status. For example, a test of manual dexterity could indicate which of several applicants was best qualified for work that depended upon manual dexterity. An instrument is said to have predictive validity if it distinguishes individuals who will differ in the future. For example, a reading-readiness test may indicate which children will be most adept in reading when they enter school.

To have construct validity, an instrument must distinguish individuals on the basis of some characteristic presumed to be reflected

in their test performance. The characteristic with which the test is concerned is not one that can be pointed to or identified with a specific kind of behavior, but rather is an abstraction or a construct. Validation of the Starkweather Originality Test provides an example of construct validity.

The Starkweather Originality Test is designed to measure creative potential. It is not presumed to measure the finer aspects of creative ability that have been identified in the creative behavior of adults, i.e., originality, elaboration, fluency, and flexibility. Therefore, the validation of the instrument had to be done in terms of some quality such as freedom of expression which was accepted as a pervasive characteristic of creative ability. In line with this reasoning, a study of children's freedom of expression and originality test scores was proposed as a method of validating the Starkweather Originality Test. Admittedly, in this example of validation, concurrent and construct validation are overlapping. Initially, the validity of the originality test was demonstrated by comparing teacher's judgments of children's originality with the children's test scores. This comparison was a crude measure of concurrent validity. The teacher's judgments introduced adult bias into the research, and a more objective validation of the instrument was needed.

At times the validity of a measuring instrument is self-evident and then it is said to have "face" validity. This is the case when an instrument focuses directly on the kind of behavior in which the researcher is interested; however, in order to assume that an instrument has face validity, two questions must be answered. One is whether the instrument is really measuring the kind of behavior that the

investigator assumes it is, and the other is whether the instrument provides an adequate sample of that kind of behavior. The research instrument developed by Starkweather and Azbill (1965) was assumed to have face validity.

> The research instrument was assumed to have "face validity"; that is, the relevance of the instrument to a child's freedom to express himself in exploring and manipulating his environment was apparent. Each child was given opportunities to play freely and his freedom in play was then measured; and in order to obtain an adequate sample of this freedom, each child was observed in ten different situations. (Starkweather and Azbill, 1965, p. 177).

For other instruments developed in the creativity research program at Oklahoma State University, face validity has also been accepted. A target game, designed to measure children's willingness to try difficult tasks, offered each child repeated opportunities to choose between a target distance that was easy and one that was hard. The actual choices made by a child indicated whether or not he was willing to try the difficult, and the instrument was accepted as having face validity. Similarily, a test of behavioral independence was accepted as having face validity because it offered each child repeated opportunities to work by himself or accept help in a situation in which he was faced with a relatively difficult task.

Implications for the Present Research

The Starkweather Originality Test was first validated by comparing teacher's judgments of children's originality with children's test scores. This was a crude measure of concurrent validity, and a more objective validation of the instrument was needed. Inasmuch as the test was designed to measure creative potential and was not presumed

to measure specific aspects of creative ability, such as those identified in creative adults, the validation of the test should be done in terms of some quality such as freedom of expression which is accepted as a pervasive characteristic of creative ability. Creative ability is also accepted as a nonintellectual variable, and therefore, a study of the relationship between verbal ability and originality as measured by the test should also be done in order to determine that the test is measuring a nonintellectual quality.

CHAPTER III

METHOD AND PROCEDURE

The purpose of the present research was to validate the Starkweather Originality Test, which was designed to measure the creative potential of young children. In this chapter the subjects and the research instruments are presented, the adaptation of the technique for measuring freedom of expression is discussed, and the method of data analysis is described.

Subjects

The subjects who participated in this study were 13 children, eight girls and five boys, who ranged in age from four years three months to four years eleven months. The children were all in attendance at nursery schools or day care centers in Stillwater, Oklahoma.

Instruments

Three instruments were selected for use in the present research: (1) The Starkweather Originality Test, which was the instrument to be validated; (2) the technique for measuring freedom of expression, designed by Starkweather and Azbill (1965); and (3) the Peabody Picture Vocabulary Test, a simple test of verbal ability. The Starkweather Originality Test is presented in Appendix B, and the Starkweather and Azbill study is presented in Appendix C.

Adaptation of the Technique for Measuring Freedom of Expression

The technique designed by Starkweather and Azbill (1965) for the measurement of freedom of expression was adapted for use in the present research. In the original study, each child was observed while playing alone with ten different sets of simple toys (ten tasks). The observations were conducted in two sessions, and there was no limit for the children's play. Each session lasted approximately 45 minutes.

The possibility of using fewer tasks in the present research was examined in a reanalysis of the scores of the children who participated in the original study. Freedom scores based on all ten tasks were compared with freedom scores based on only four tasks. These scores and ranks derived from the raw data of the original study are presented in Table I. A Spearman rank correlation between these two sets of scores yielded a coefficient of +0.922, which was significant beyond the .001 level.

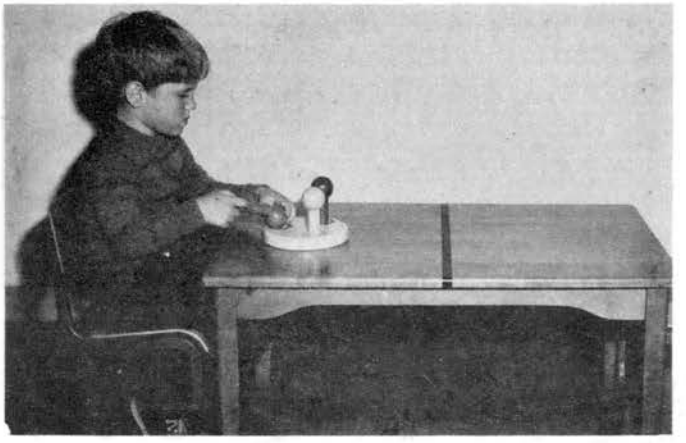
The four tasks used in the present research and illustrated in Figure 3, were presented in the following order: (1) a Playskool three-peg toy; (2) flat interlocking train sections and unpainted wooden blocks; (3) a wooden school bus and cork balls one inch in diameter; and (4) a pan of water and wax discs two inches in diameter. The tasks were administered and scored as described in the Starkweather and Azbill report (Appendix C). Each child played by himself with the toys, one set at a time, and was observed through a one-way mirror. His play behavior was recorded in a running record which was scored jointly by two researchers--one who knew the children and gave them

TABLE I

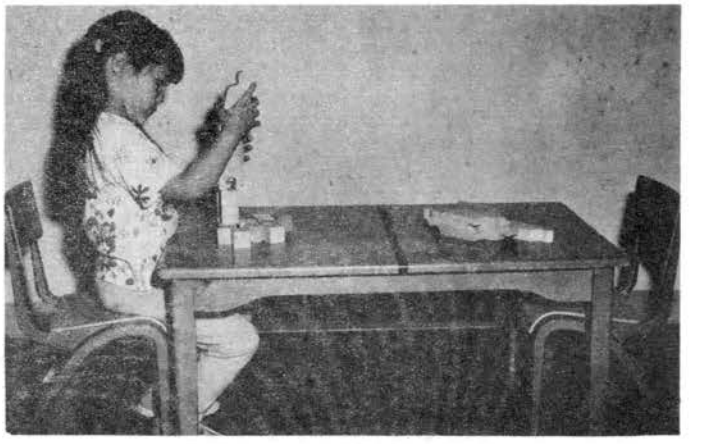
CHILDREN'S SCORES FOR FREEDOM OF EXPRESSED BASED ON RESPONSES TO FOUR TASKS AND TO TEN TASKS*

	Freedom Scores			
	Four Tasks		Ten Tasks	
Child	Score	Rank	Score	Rank
L	38.5	1.0	97.0	1.0
B	36.0	2.5	91.5	2.0
M	36.0	2.5	79.5	5.0
D	33.0	4.0	71.5	6.0
J	32.5	5.0	89.0	3.0
K	27.5	6.0	81.5	4.0
F	25.5	7.0	52.0	8.0
A	22.0	8.0	64.0	7.0
E	20.5	9.0	47.0	10.0
H	19.5	10.0	49.0	9.0
G	15.0	11.0	37.5	11.0
C	6.0	12.0	20.5	12.0

*Reanalysis of data from Starkweather and Azbill (1965).

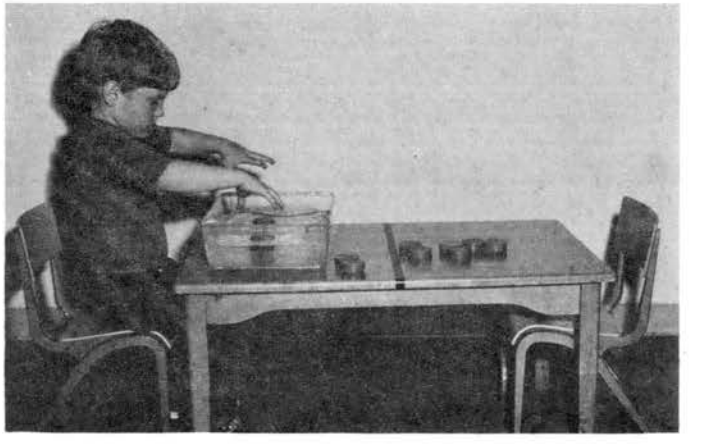


Three-Peg Toy



Train Sections and Blocks

Bus and Cork Balls



Water and Wax Discs

Figure 3. The Four Tasks Used in the Measurement of Freedom of Expression

the toys with which to play, and one who observed through the one-way mirror and tape recorded the children's play behavior.

Scoring consisted of giving each child credit for the number of different ways that he played with each set of toys. Each child received four raw scores, one for each task. These raw scores were then converted into rank order scores. Each child's "freedom" score was then the sum of these four ranks, indicating his freedom of expression relative to that of the other children in the group.

Data Analysis

The following three scores were available for each child who participated in the validation of the Starkweather Originality Test; an originality score, a score indicating freedom of expression, and a verbal ability score. Spearman rank order correlations among these three scores were calculated in order to determine whether the originality test provides a valid measure of creative potential, that is, whether it does measure a nonintellectual variable which is related to freedom of expression.

CHAPTER IV

RESULTS

Validation of the Starkweather Originality Test was achieved by comparing children's test scores with scores which indicated their freedom of expression. Beyond this, originality test scores and verbal ability scores were compared in order to be certain that the originality test was measuring a nonintellectual quality. The data analysis is discussed in the present chapter. Descriptive data and test scores for the individual children are presented in Table II; the results of the statistical analyses are presented in Table III; and the children's raw scores, from which their freedom scores were calculated are presented in Table IV, Appendix A.

Originality and Freedom of Expression

Originality test scores and scores indicating freedom of expression were compared in order to determine whether the originality test provides a valid measure of children's creative potential. Freedom of expression, as a pervasive quality of creative ability, was accepted as the quality to which originality should be related if the originality test were valid. A Spearman rank order correlation between these two sets of test scores yielded a coefficient of +0.687, which was significant beyond the .02 level. Originality and freedom of expression are significantly related and the originality test was accepted as valid.

TABLE II

CHILDREN'S SCORES AND RANKS FOR ORIGINALITY, FREEDOM OF EXPRESSION AND VERBAL ABILITY

Sex and Code Number	Age	Originality[1]		Freedom[2]		Verbal Ability[3]	
		Score	Rank	Score	Rank	Score	Rank
F-1786	4:6	30	1.5	09.5	1.0	58	4.0
M-1660	4:11	30	1.5	32.0	7.5	57	6.0
F-1777	4:6	18	4.0	17.0	3.0	52	10.0
M-1662	4:6	18	4.0	17.5	4.0	61	1.5
M-1664	4:4	18	4.0	19.5	5.0	48	12.5
F-1784	4:4	17	6.0	27.5	6.0	48	12.5
F-1668	4:8	15	7.0	38.0	10.0	54	9.0
F-1799	4:10	13	8.0	13.0	2.0	57	6.0
F-1669	4:6	12	9.5	36.0	9.0	56	8.0
M-1791	4:5	12	9.5	39.0	11.5	61	1.5
F-1788	4:7	11	11.0	44.0	13.0	57	6.0
F-1785	4:3	10	12.0	32.0	7.5	50	11.0
M-1790	4:4	08	13.0	39.0	11.5	59	3.0

[1]Originality: Starkweather Originality Test, Form-A.

[2]Freedom of Expression: The variety of a child's responses when playing by himself with a series of simple toys. (Starkweather and Azbill, 1965).

[3]Verbal Ability: Peabody Picture Vocabulary Test.

TABLE III

SPEARMAN RANK CORRELATIONS
(N = 13)

Variables	rho	p
Originality and Freedom of Expression	+0.687	<.02
Originality and Verbal Ability	+0.073	n.s.
Verbal Ability and Freedom of Expression	+0.067	n.s.

Originality and Verbal Ability

If the originality test measures a nonintellectual variable, then the test scores should not be related to verbal ability. A Spearman rank order correlation between originality test scores and verbal ability scores (PPVT Test) was not statistically significant. The originality test was accepted as measuring a nonintellectual variable.

Verbal Ability and Freedom of Expression

In the Starkweather and Azbill study of freedom of expression, an analysis of freedom scores and intelligence test quotients (Stanford-Binet) indicated that freedom of expression, like creative ability was a nonintellectual variable. This finding was supported in the present research. A Spearman rank order correlation between verbal ability and freedom of expression was not statistically significant.

Summary

1. The Starkweather Originality Test is accepted as a valid measure of young children's creative potential. Children's scores on the test correlate significantly with their freedom of expression, which is accepted as a pervasive characteristic of creative ability.

2. Originality test scores are not related to verbal ability. The test is accepted as measuring a nonintellectual quality.

3. Freedom of expression, as a pervasive characteristic of creative ability, was again shown to be a nonintellectual quality. Children's freedom scores were not related to their verbal ability scores.

CHAPTER V

SUMMARY AND IMPLICATIONS

Summary

The purpose of the present research was to validate the Starkweather Originality Test, a test designed to measure the creative potential of preschool children. Validation was achieved by comparing scores on the originality test with scores indicating the freedom with which the children expressed themselves in exploring and manipulating objects in their environment. Both originality and freedom of expression are considered essential qualities of the creative person.

The subjects who participated in the research were 13 children, eight girls and five boys, who ranged in age from four years three months to four years eleven months. The children were all in attendance at nursery schools or day care centers in Stillwater, Oklahoma.

Three instruments were selected for use in this research: (1) the Starkweather Originality Test, which was the instrument to be validated; (2) an adaptation of the technique for measuring freedom of expression, developed by Starkweather and Azbill; and (3) the Peabody Picture Vocabulary Test. Scores from these three tests provided the data that was used in an analysis of the relationships among originality, freedom of expression, and verbal ability.

The Starkweather Originality Test is accepted as a valid measure of young children's creative potential, inasmuch as scores on the test correlate significantly with freedom of expression, which is an essential quality of the creative person. Beyond this, as indicated by a comparison of originality scores and verbal ability, the originality test is accepted as measuring a nonintellectual quality.

Implications

With the validation of the Starkweather Originality Test, the instrument is now ready for extensive use in creativity research with young children. For a number of years an instrument of this type has been needed. For example, research intended as a study of the factors which influence the development and expression of creative ability in early childhood is dependent upon the availability of an instrument such as the Starkweather Originality Test. Nevertheless, it is recommended that the test be used with care and caution. Creativity is an elusive quality, and a child's performance on the originality test will be best understood when seen in relation to other characteristics, such as motivational factors, which affect creative expression. Profile studies of creativity in early childhood are now needed.

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APPENDIX A

TABLE IV

RAW SCORES AND RANKS FROM WHICH THE FREEDOM SCORES WERE CALCULATED FOR INDIVIDUAL CHILDREN

Sex and Code Number	Age	Tasks Designed to Measure Freedom of Expression								Freedom Score*
		Three-Peg Toy		Blocks and Train Sections		Bus and Cork Balls		Water and Wax Discs		
		Score	Rank	Score	Rank	Score	Rank	Score	Rank	
F-1786	4:6	13	4.0	11	3.0	29	1.0	35	1.5	09.5
M-1660	4:11	14	3.0	06	7.0	08	11.5	13	10.5	32.0
F-1777	4:6	05	9.5	12	2.0	16	4.0	35	1.5	17.0
M-1662	4:6	12	5.5	08	5.0	23	2.0	20	5.0	17.5
M-1664	4:4	18	1.0	08	5.0	13	7.5	19	6.0	19.5
F-1784	4:4	07	7.0	08	5.0	08	11.5	24	4.0	27.5
F-1668	4:8	03	12.5	03	11.0	08	11.5	25	3.0	38.0
F-1799	4:10	17	2.0	17	1.0	22	3.0	18	7.0	13.0
F-1669	4:6	05	9.5	01	13.0	15	5.5	17	8.0	36.0
M-1791	4:5	05	9.5	03	11.0	15	5.5	05	13.0	39.0
F-1788	4:7	05	9.5	03	11.0	08	11.5	12	12.0	44.0
F-1785	4:3	12	5.5	05	8.5	13	7.5	13	10.5	32.0
M-1790	4:4	03	12.5	05	8.5	10	9.0	16	9.0	39.0

*The Freedom Score is the sum of the ranks.

APPENDIX B

STARKWEATHER ORIGINALITY TEST

FOR PRESCHOOL CHILDREN*

developed by
Elizabeth K. Starkweather

Oklahoma State University
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The Starkweather Originality Test is designed to measure the creative potential of preschool children. In the test, no attempt is made to differentiate among the various factors of creative ability, such as flexibility, fluency, originality, and elaboration. It is possible that all of these factors contribute to a high score on the Originality Test, and it is also possible that strength in one factor alone may be sufficient to produce a high score.

Recommended Age Range

Approximately 3 years 6 months to 6 years 6 months.

Children younger than 3 years 6 months can be given the Originality Test if their ability to communicate verbally is satisfactorily demonstrated during the pretest or warm-up session.

Older children obtain higher test scores than do younger children. When the test is administered to older children, e.g., seven-year-olds, the median score is apt to be near the ceiling of the test, with the result that the less original children are identified but the more original children are not.

The Pretest

The pretest consists of eight plastic foam pieces, two each of four shapes. One of each shape is white and the other is pastel.

The pretest pieces are placed on a table before the child, and he is encouraged to manipulate them and talk about them. He may be asked a question such as, "Do you see a piece that looks like something?"

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*The Starkweather Originality Test was developed as part of a creativity research program supported by the Research Foundation at Oklahoma State University.

or "Could one of them be something?" When the child responds, the experimenter agrees with his comment, whatever it is, and moves that piece to one side. He then encourages the child to talk about another piece.

If the child does not respond, the experimenter picks up the rectangular piece and asks, "What could this be?" If the child still does not respond, the experimenter makes a suggestion in the form of a question, e.g., "Do you think it could be a window?" The experimenter then moves this piece to one side and encourages the child to talk about another piece.

During the pretest, the child is encouraged to think of different responses for the various pieces. If he gives the same response for more than one piece, his response is accepted, but he is asked to think of something else that the piece might be. For example, if the child says that two different pieces could be a door, the experimenter accepts his response and at the same time encourages him to think of something different. "Yes, it certainly could be a door, but we already have one door. Can you think of something else that it could be?" To complete the pretest satisfactorily, the child must give at least five different responses.

The Originality Test

The test proper consists of 40 plastic foam pieces, four each of ten different shapes. The identically shaped pieces are made in four colors -- red, blue, green, and yellow.

Administration. When the child has satisfactorily completed the pretest, a box containing half the test pieces is placed on the table before him. The box contains 20 pieces, two of each shape in assorted colors. The child is encouraged to take the pieces one at a time and tell what each might be. The experimenter may say, as he places the box on the table, "Now we have all these. You take one -- any one -- and tell me what it could be." The child's response is accepted, and approval is given by saying something such as, "All right" or "It certainly could be." As the child finishes with each piece, he is directed to put it into a second box (the inverted lid) which has been placed near him for that purpose.

Whether or not the child gives different responses for the various shapes, his responses are accepted and approved. The child is NOT encouraged to give different responses to pieces which are of the same shape as was done in the pretest.

Occasionally a child will take two or more pieces and construct something with them as he talks. When this happens, he is encouraged to respond to each piece separately. For example, "All right, but what could this piece be all by itself?"

When the child has completed the first box of test pieces, the box containing the remaining 20 pieces is presented to him in a similar manner.

Scoring. The test provides four opportunities for the child to respond to each shape, making a total of 40 responses. Each child's score is the number of different responses he gives, with the maximum possible score being 40. Responses are scored in the order in which they appear on the score sheet with the child's responses to the first 20 pieces (the first box) being scored before his responses to the last 20 pieces are scored. Credit is given for each response which is different from all previous responses. Credit is given for objects which might be in the same category, such as a golf ball and a baseball. Credit is not given for an object which is named a second time and altered by a minor adjective, such as a ball and a big ball. No credit is given for a play on words, such as kigless, pigless, and sigless. (See scoring directions.)

Evaluation of the Originality Test

Inter-judge reliability in scoring was determined by a comparison of two sets of scores. (1) The responses of individual children were scored jointly by two judges who participated in the development of the test; and (2) the same responses were scored by another person, trained in child development, but who had no experience with the test and who had no instructions other than the written directions for scoring. The coefficient of correlation (Pearson product-moment) between the two sets of judges' scores was +0.989, significant beyond the .01 level. In view of these findings, the directions for scoring were accepted as adequate. Their use should assure reliable scoring.

The internal consistency of the instrument was demonstrated by means of a split-half correlation (Spearman-Brown formula). A coefficient of +0.932 ($p<.01$) indicated that the test was reliable.

The validity of the instrument was demonstrated by comparing teachers' judgments with children's scores. Each child who scored high in originality was paired with each child who scored low, and the teachers were then asked to indicate the child who was the more original in each pair. Teachers' judgments were in the direction of the originality scores in 106 pairs out of a total of 153. A Chi-square analysis indicated this extent of agreement to be statistically significant. ($\chi^2 = 22.752$; $p<.001$).

The validity of the instrument was also demonstrated by comparing the originality scores of 13 children with their freedom of expression. The freedom scores were determined by the variety of each child's play responses when given an opportunity to play alone with a series of simple toys. A rank order correlation indicated a statistically significant agreement between these two sets of scores (rho = +0.687; $p<.05$). The Originality Test was accepted as valid.

Test results indicate age differences in originality, but not sex differences. In a group of 80 children ranging in age from 3 years 6 months to 5 years 11 months, the older children earned the higher scores in originality. ($\chi^2 = 17.39$; $p<.01$).

Two forms of the Originality Test (Form-A and Form-B) have been developed for use in test-retest research. The comparability of the two forms has been demonstrated by a product-moment correlation, yielding a coefficient of +0.904 ($p<.01$). For this comparison, 18 children ranging in age from 3 years 4 months to 5 years 11 months were tested with both forms of the test.

The Originality Test requires verbal responses; nevertheless, the originality scores are independent of verbal ability. This was demonstrated by a correlation of Peabody Picture Vocabulary scores (verbal ability) and Originality Test scores. The product-moment correlation coefficients for these two sets of scores were +0.192 for Form-A and +0.162 for Form-B, neither of which was statistically significant.

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DIRECTIONS FOR SCORING THE ORIGINALITY TEST

A. Score the responses in the order in which they appear on the score sheet, first scoring columns A and B together and then scoring columns C and D together.

(1A - 1B - 2A - 2B - 3A - 3B - etc.)

B. Mark each response either + for credit or - for no credit.

Mark a response +, if it is different from all previous responses.

When in doubt, give the child credit.

C. Categories of objects

1. A child may name objects which are similar in category.

The child receives credit for each different type of object in the category.

Ex: golf ball (+), baseball (+), moth ball (+)

2. A child may name a category and name specific objects in the category.

Ex: ball (+), rubber ball (+), baseball (+)

D. Examples of no credit

1. A child does not receive credit when he combines two previous responses for which he has received credit.

Ex: Tree (+), cookie (+), tree cookie (-)

2. A child does not receive credit when he names an object a second time altering it with a minor adjective.

Ex: ball (+), big ball (-), half ball (-)

Ex: duck (+), part of a duck (-)

Ex: egg (+), round egg (-)

Ex: red ball (+), blue ball (-)

3. The child receives no credit for a play on words.

Ex: kigless (-), pigless (-), sigless (-)

E. Some children look about the room for ideas. This is noted on the score sheet. For such responses, the child receives credit if there is a possible relationship between the response and the test form.

STARKWEATHER ORIGINALITY TEST

FORM - A FOR PRESCHOOL CHILDREN FORM - A

Name Child F-1888 Sex F Number 1888

Date 7-17-70 Birthdate 8-29-64 Age 5:11

Testing Place Kiddie Klub

SCORE 23

	A	B	C	D
1. 	table +	table −	Party table +	Pickup truck +
2. 	"O" +	"O" −	can end +	telescopes +
3. 	Block +	Box +	Block −	Box −
4. 	"e" +	9 +	6 +	9 −
5. 	tester totter +	Play boat +	car +	car −
6. 	Cave +	Cave −	Cave −	Cave −
7. 	raindrop +	raindrop −	raindrop −	raindrop −
8. 	Ball +	Balloon +	rocker +	Ball −
9. 	part of a rainbow +	eye +	part of a dress −	Boat +
10. 	Part of a dress +	dress −	dress −	Dress −

STARKWEATHER ORIGIANLITY TEST

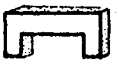
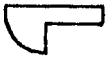
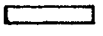
FORM - B FOR PRESCHOOL CHILDREN FORM - B

Name Child F-1888 Sex F Number 1888

Date 7-28-70 Birthdate 8-29-64 Age 5:11

Testing Place Kiddie Klub

SCORE 32

	A	B	C	D
1. 	"U" +	door +	Bridge +	part of an "A" +
2. 	can't think of anything −	can't think of anything −	thing you see how big they are +	thing you see shows how much you weigh +
3. 	opening of a cave +	cave −	Bridge −	coffee table +
4. 	hair spray top +	something you sit on +	cookie +	horse with that's going to fall
5. 	"L" +	"R" +	L" made out of cotton +	"R" −
6. 	Rainbow +	part of a round pillow +	Rocking bed +	"C" +
7. 	Bear face +	Buffalo face +	Pig face +	Snowman with a bonnet on top +
8. 	cut out picture +	Snowman +	Snowman −	part of a man +
9. 	Stick +	part of a gate +	ironing board +	door +
10. 	Ride at amusement park +	Record Player +	Cookie −	half an apple +

APPENDIX C

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An Exploratory Study of Preschool Children's Freedom of Expression[1]

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Introduction

A study of preschool children's freedom of expression was undertaken as a pilot study of creative ability in young children. Basically, the problem in this area of research is one of identifying the factors comprising creativity in order that the potentially creative child be recognized. The problem then becomes one of discovering how this potential can be encouraged to full fruition.

Theory and research have contributed to the list of personality characteristics considered necessary for the expression of creative ability. One of these characteristics is the individual's freedom of expression. Here the supposition is that unless a person is free to express himself in exploring the objects and ideas in his environment, he cannot demonstrate creative ability. (e.g., Barron, 1955; Guilford *et al.*, 1957; Rogers, 1959; Torrance, 1962.) Beyond this, creative ability has been defined as a nonintellectual variable (Thurstone, 1950; Getzels and Jackson, 1960); therefore, a task measuring freedom of expression must be independent of intellectual ability and acquired skills.

Subjects

The subjects were children attending nursery school at Oklahoma State University. Only American born white children four years old at the time the research was initiated were included in the study. Subjects were selected in this manner in an attempt to eliminate the possible influence of cultural and age differences. Specifically, the subjects were 12 children, four boys and eight girls, ranging in age from four years eight months to five years five months.

The Research Instrument

A child's freedom of expression was determined by the variety of his play responses when given an opportunity to play by himself with a series of simple toys.

Criteria

Trial observations of individual children playing with a variety of toys served to clarify the criteria for the instrument. (a) The toys should be simple; play with them should be independent of intelligence and acquired ability. (b) The toys should be ones which could be put to a number of uses and which could be played with singly or in combination. (c) The toys should be ones with which the children have had little or no previous experience. (d) The research laboratory should be familiar to the children and should present no known opportunities for play other than play with the toys. (e) Social influences should be eliminated insofar as possible; the child should be alone with the toys.

Toys

The toys selected for the instrument were presented in two sessions. *Session A* consisted of (a) Small bottles filled with blue rubber dots;

[1]Supported by the Oklahoma State University Research Foundation, State Project No. 128.

(b) Cork cubes and a pan of water; (c) Yellow wax discs and a pan of water; (d) Yellow wax discs and red rubber dots; and (e) Wooden train sections and red rubber dots. *Session B* consisted of (a) Wooden train sections and wooden blocks; (b) Toy school bus and wooden blocks; (c) Toy school bus and cork balls; (d) Pipe cleaners and cork balls; and (e) Round Block Stack (a Playskool Toy).

Half of the children were presented the Session A toys first, and half were presented the Session B toys first.

Procedure

Individually each child was taken to the research laboratory, a room with which he was familiar. In the room there was a small rectangular table with a chair at each end. Across the middle of the table was a strip of black masking tape. On the table were two simple toys, one at each end with the masking tape serving as a "psychological" barrier between the two. The child was told that he could do whatever he wanted to do with the toys. The experimenter then excused herself, ostensibly to get more toys, and went to an observation booth where she observed the child through a one-way mirror and dictated on a tape recorder a running record of everything the child did. When the child was through playing with one set of toys, the experimenter removed one of them and replaced it with a new toy. There was no time limit for the child's play; each had his own way of indicating when he was through. Some called the experimenter; some hid under the table; some looked out the window.

Scoring

The record of each child's play was transcribed and edited. Editing involved the condensation of elaborate details and the elimination of irrelevant material. The edited record was then scored. This consisted of giving each child credit for the number of different ways in which he played with the toys.

The directions for scoring were as follows: (a) Sensory experiences: One point for each different sensory experience in which the child may have learned something about the toy. This includes tasting, smelling, visually examining the toy, and manipulating or experimenting with it. (b) Active play: One point for each different unit of active play with the toy or toys. This includes dramatic play and games the child may invent. Merely moving the toy from one place to another is not considered active play. (c) Construction: One point for each different type of construction that is made with the toy or toys. (d) Combination: One point for combining the two toys in play at any time during the task.

Each child received ten raw scores, one for each set of toys with which he played. These raw scores were then converted into rank order scores, inasmuch as the instrument could be used only to determine the relative freedom of each child within the group being studied. The sum of the ten rank order scores was the child's "freedom score."

Validity

The research instrument was assumed to have "face validity"; that is, the relevance of the instrument to a child's freedom to express himself in exploring and manipulating his environment was apparent. Each child was given opportunities to play freely and his freedom in play was then measured; and in order to obtain an adequate sample of this freedom, each child was observed in ten different situations.

Reliability

Inter-judge reliability was first demonstrated during the trial obser-

vations. Four judges showed acceptable agreement in the scoring of 26 observations; there was no more than one point difference in their raw scores on 22 of the observations. One of these four judges who had no part in the data gathering, was then chosen to score the edited records in the final research. The records were also scored by a research worker who had observed the children and assisted with the editing. The coefficient of correlation between the judge's scoring and that of the research worker was $+0.929$ ($p < .01$).

The internal consistency of the instrument was demonstrated by a split-half correlation (Spearman-Brown formula). The coefficient of reliability was $+0.895$ ($p < .01$).

The instrument and the method of scoring were accepted as reliable.

Results

The "freedom scores" of individual children are presented in Table I. The range of scores from 20.5 (least free) to 97.0 (most free) shows that the instrument did discriminate among these 12 children. The scores obtained during each of the two sessions indicate that the children were not more free during the second session of play as might have been expected. Greater freedom was shown by half (six) of the children during the first session.

Relation of IQ's to Freedom Scores

Inasmuch as creative ability has been defined as a nonintellectual variable, the instrument developed to measure freedom of expression must be independent of intellectual ability and acquired skills. A comparison of freedom scores and Stanford-Binet intelligence test scores (Terman and Merrill, 1960) indicated a statistically significant negative correlation. (Spearman rank correlation coefficient, rho $= -0.715$; $p < .01$.) This significantly high negative correlation suggests that further research be done in order to determine the causes of this relationship.

Recommendations for Future Use of the Research Instrument

The research environment must be one in which the children feel as

TABLE I

DESCRIPTIVE DATA FOR INDIVIDUAL CHILDREN PARTICIPATING IN AN EXPLORATORY STUDY OF FREEDOM OF EXPRESSION: AGE, SEX, IQ, AND FREEDOM SCORE

(Ages are expressed in years and months)

Child	Sex	Age	IQ	Freedom Score
A	F	4-11	134	64.0
B	M	4-10	98	91.5
C	F	5-3	142	20.5
D	F	5-1	112	71.5
E	M	5-3	117	47.0
F	F	5-0	145	52.0
G	M	4-11	142	37.5
H	F	5-5	115	49.0
J	M	4-11	110	89.0
K	F	5-2	128	81.5
L	F	5-2	93	97.0
M	F	4-8	139	79.5

free as possible; therefore, an opportunity to become familiar with the laboratory and the experimenter must precede the use of the instrument. Data gathering can be limited to one session for each child inasmuch as no real increase in freedom was observed during the second session. Nine or ten different toys could be used, each being presented only once and thus providing the child with maximum opportunity for exploring and manipulating in the one session.

A study of the children's responses during the trial observations and during the final research indicated that certain toys are somewhat better suited for the instrument than others. A one-session series of toys is suggested as follows: (a) a pan of water and styrofoam balls, (b) a dump truck and wax discs, (c) cork balls and pipe cleaners, (d) red rubber dots and wooden train sections, and (e) Three Peg Playskool Toy.

The tape recorder proved to be most practical for detailed recordings. Objectivity in recording is essential and may be assured if two people, both of whom observe the children, serve as a double check in editing, thereby eliminating any subjective statements in the initial dictation. The scoring directions have proven to be adequate and should be retained.

In any future use of this instrument, one must remember that a child's freedom score indicates only his relative position in the group of children being studied.

Summary and Implications

A study of preschool children's freedom of expression was undertaken as a pilot study of creative ability. The instrument which was developed proved successful in discriminating among the children, and demonstrated marked differences in their freedom of expression. If one assumes that every child is born with some potential for expressing himself freely, then one must assume that the present study included children in whom this freedom had been encouraged and other children in whom this freedom still lay dormant or had been stifled. The findings suggest that this encouragement, and possibly the stifling, can occur before a child is five years of age; and therefore, a search for the factors which influence the development of creative ability should start with the early school years.

A significant negative correlation was found between freedom of expression and intelligence test scores, supporting the assumption that freedom of expression, like creative ability, is a nonintellectual variable. This negative relationship must not be interpreted as meaning that highly intelligent children lack freedom to express themselves, but it does indicate the advisability of research into the causes of the relationship which appeared in the present study. A hazarded guess is that the demands made on children for conformity and achievement may in some way inhibit their freedom of expression. A study in which the variable of intellectual ability is controlled could yield information about possible factors which influence the development of freedom of expression and, in turn, the development of creative ability.

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